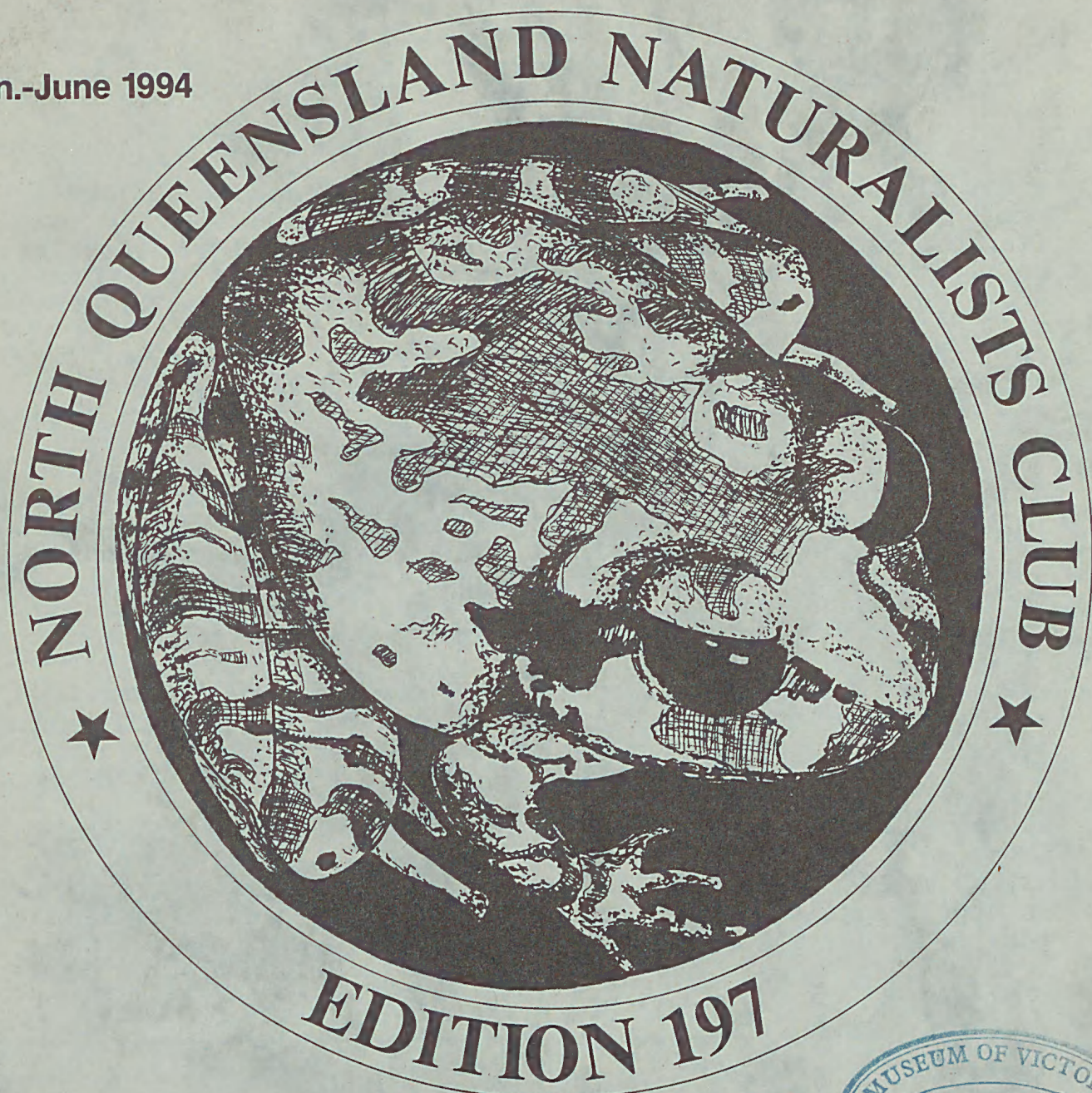
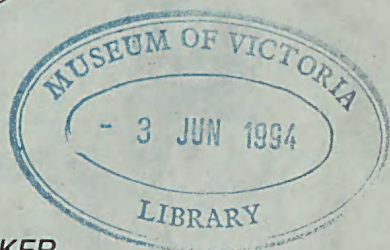


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FIELD DAYS: Sunday before meeting.

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FROM THE EDITOR

1994 has already gathered momentum and as we're all aware another 'wet' season, Easter and the Georgetown camp are already behind us. Guest speakers on our calender are well worth your attendance with field trips and additional camps to cover everyone's interests.

This particular Journal No. 197 offers another 1st for The North Queensland Naturalist. Our colour photographs depict the Pseudophryne sp. a new frog and its habitat which was originally found by William Hosmer in 1977 and which will be officially named later this year. It has been an honor to meet and talk with William who has allowed us to publish this and other most interesting material for future issues. Although this introduction of William's series of articles is a 'Field Study' the subsequent stories from behind the scietific scene of remote areas of WA to the canopy of Borneo's jungle will be both exciting and informative reading.

William 'knew and was encouraged by the club's founder Dr. Hugo Flecker to persue a natural interest and to study Zoology'. Although retired he is still a keen Herpertologist who has, and always will treat 'every day as a holiday'.

A special thanks to all those who have written these, previous and future articles for the Journal. We offer a sincere apology to Daryn Storch for the transcript error which occurred in the last Journal details of which are on Page 21 and for any other unintentional errors which may have already been printed.

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THE TINAROO REPORT - 'CRAKES'

By: Ben Constable

For over a year falling waters have left this arm of Lake Tinaroo dry but for a meager flow down the old creek bed. Fortunately a good body of water remains upstream held back by a small dam across the channel to provide sufficient depth for the irrigation pump. With waist high grass providing cover on the long banks and lily pads on the surface, this meandering stretch of water has provided an attractive haven for many water birds, not to mention the family of Platypus that have been spared the trauma of leaving this oasis for the deeper water downstream.

Salvinia weed appeared here in early '92 and whilst biological control has contained the spread, large rafts of the weed still survive. After it became established the number of Dusky Moorhens dramatically increased and where once sighting a single bird was an unusual event now six or more birds can be seen on the water at any one time. I reasoned if the weed appealed to the Moorhens then it might also tempt the Crakes (which I believed were in the vicinity) to venture into the open where it would give me a chance to study them. I did occasionally glimpse a small bird flying across the creek but it was not until January '93 that I began to hear what I was sure were the calls of White Browed Crakes. Each day for over a week I spent the first hour of daylight searching for these elusive birds without success, although I continued to hear them call from the dense cover.

My efforts were rewarded! Whilst standing on a two metre high bank a White Browed Crake strolled out onto the lily pads with unbelievable nonchalance almost beneath my feet. The birds must have decided I posed no threat to them as from then on I was to see one, sometimes two, regularly, often at close range as they fed amongst the Salvinia weed.

These Crakes were last seen in early March and although I continued to visit the area each morning it wasn't until Boxing Day of that year when I looked down from a six metre high bank I saw a small bird walk tentatively across an open stretch of water separating the Salvinia weed from the bank by using a branch of a Water Primrose (*Ludwigia*) as a makeshift bridge. This sighting proved to be an extra bonus for it was not the bird I expected to see but a Spotless Crake (*Porzana tabuensis*). Although it disappeared as soon as it reached the dense cover the bank I had a perfect sighting of this secretive dark bird with its unmistakable bright red legs.

No more Crakes were seen until late January and this occurred when I was on my way home for breakfast and decided to have one last look up the creek, where in the distance I saw a small nondescript bird stalking about on the Salvinia weed. I retraced my steps and made it to the waters edge without disturbing the bird which by then had climbed into the branches of the Water Primrose bush where it commenced

preening. This one was a Baillons Crake (*Porzana pusilla*), and I was able to study in detail this plump sparrow size bird for some fifteen minutes as it performed its toilet, after which it hopped down and pecked about in the weed for a while before flying upstream.

The next morning I saw one fly across the water to settle in the tall weeds where once again it carried out its ritual preening. When the operation was completed to its satisfaction it clambered through the branches until it was above the water and then flew off to find some more *Salvinia* and began feeding.

Two days later I came across a pair of White Browed Crakes feeding together on a patch of *Salvinia* showing no concern at my presence although I was in the open only twenty metres away. I continued to see both species regularly until the end of February, after which I only heard the White Brows call a few times from the thick grass.

Both species seemed to favour a perch in the Water Primrose for preening purposes, where the elevation combined with the plants bare limbs provided a wider field of vision and both seemed adept at climbing through and over these plants, although their progress could not be said to be speedy. When the White Brows were feeding amongst the young shoots of Smart weed (*Polygonum*) growing from the water, their presence was often betrayed by an attendant Willie Wagtail that followed the larger bird to catch the insects it disturbed. While I only heard the Baillons Crake call a couple of times (it reminded me of the distant call of a mating Cane Toad, but a brief duration) the White Brows had a more varied repertoire. Apart from a series of subtle clucks and grunts its most noticeable call was a fairly loud 'Whi-chup' and at times both would join in a peal of shrill maniacal laughter. One, when it spotted me across the creek, stood very erect and gave me repeated warning calls best described as the sound made by a person's forcible exhalation of breath.

Now I only hope that the recent lack of sightings does not indicate a pattern of movement like last year's, for I would prefer not to have to wait another ten months before being able to once again enjoy the company of these cryptic little birds...

OUR COVER

Our thanks once more the club's member and artist Judy Stephens of Ravenshoe for her sketch of the Northern barred frog *Mixophyes schevilli* which inhabits fast flowing streams in mountainous rainforests on the Atherton Tableland. It seemed quite appropriate for the Journal's cover as frogs seem to be the 'flavour' of the year - but not gastronomically speaking of course...

NOTES ON THE VEGETATION OF SECTION 'D' CAIRNS CENTRAL SWAMP

By: Rob Jago

This section is the largest of all the seven sections within the study area and together with section 'C' forms the core area of the whole central swamp complex.

Some 274 species of vascular plants have been recorded from this section to date. Some 222 species being native to the area while some 52 species of introduced exotic plants have naturalized themselves in this section. Some of these introduced plants have the potential to become serious pests if left to grow unchecked.

Four main vegetation types occur in this section:-

- D1. The south eastern end consists of an area of land that has, in recent times, become colonized by mangroves and other plants associated with a marine ecosystem.
- D2. Areas of open woodland dominated by Acacia and Eucalyptus species. This type occurs on the higher sand ridges.
- D3. Areas of melaleuca and pandanus dominated woodland, this type occurs along the swales and in other low lying areas with a high water table.
- D4. Areas of closed forest which contain many different types of rainforest type plants, some of which appear to have only recently become established in this area.

In addition to these areas, there are some quite large areas which have been disturbed and/or cleared. These disturbed areas have become quite degraded by the dumping of rubbish and old car bodies. Rubbish dumping in this section appears to be a common and everyday practice. The area appears to be used as campsites for displaced and homeless people, as many old campsites occur throughout the whole of this section. All such campsites are surrounded by large quantities of rubbish.

This section is typical of the Central Swamp complex as a whole, parts of this area are very beautiful, while others are a disgrace to our city. Only a few hours were devoted to field work in this section and many plant species that occur in this section will, no doubt, have been overlooked.

Additional species will be added to the Check Lists as they come to hand. This updated list will be kept in the Club's Library. A 'Check List in Family Order' has also been compiled and will hopefully be published in a future edition of the Naturalist Club Journal.

PRELIMINARY CHECK LIST OF PLANT SPECIES NATIVE TO SECTION 'D'
CAIRNS CENTRAL SWAMP AND ASSOCIATED WETLANDS

By: R. Jago

PTERIDOPHYTES Ferns

Acrostichum speciosum	Mangrove fern	C
Asplenium nidus	Birds nest fern	C
Blechnum idicum	Swamp water fern	C
Cheilanthes tenuifolia	Rock fern	U
Christella dentata	Binung	C
Drynaria rigidula	Basket fern	C
Helminthostachys zeylanica	Flowering fern	U
Lindsaea ensifolia s. sp. agatii		C
Lygodium microphyllum		C
Marsilea mutica		U
Nephrolepis oblitterata		U
Platynerium hillii	Northern elkhorn	C
Pteridium semihastatum	Northern bracken	C
Pyrrosia longifolia		C
Schizea dichotoma	Branched comb fern	C
Stenochlaena palustris	Climbing swamp fern	C

GYMNOSPERMS

Cycas media		C
Podocarpus grayae	Brown pine	U

ANGIOSPERMS Dicotyledons

Abroma fastuosa		U
Abrus precatorius	Gidee gidee	C
Acacia aulacocarpa	Black wattle	C
Acacia crassicarpa	Brown wattle	C
Acacia flavescens	Red wattle	C
Acacia mangium	Sally wattle	C
Acanthus ilicifolius	Holly leaf mangrove	U
Acmena hemilampra s. sp. hemilampra	Cassowary gum	C
Aegiceras corniculatum	River mangrove	C
Alphitonia excelsa	Red ash	C
Alstonia muellerana	Hard milkwood	C
Alstonia scholaris	Milky pine	U
Alyxia spicata	Climbing chain fruit	C
Ampelocissus acetosa	Native grape	C
Archidendron grandiflorum	Tulip siris	C
Avicennia eucalyptifolia	Grey mangrove	C
Balanophora fungosa		U
Barringtonia calyptrata	Mango pine	C
Beilschmiedia obtusifolia	Blush walnut	U
Brachychiton acerifolius	Flame kurrajong	U
Breynia stipitata	Stinking leaf tree	C
Bucea javanica		U
Bruguiera gymnorhiza		C
Buchanania arborescens	Satinwood	C
Calophyllum inophyllum	Alexandrian laurel	U
Cananga odorata	Woolly pine	U

Canarium australianum s. sp. glabrum	Mango bark	C
Canthium coprosmoides		U
Capparis lucida		C
Carallia brachiata	Corky bark	C
Cassine melanocarpa		C
Cayratia maritima	Native grape	C
Celtis paniculata	Silky celtis	U
Ceriops tagal		C
Chionanthus ramiflorus	Native olive	C
Claoxylon tenerifolium		C
Cleistanthus apodus		C
Clerodendrum floribunda		C
Clerodendrum inerme		C
Clerodendrum longiflorum var. glabrum		C
Commersonia bartramia	Brown kurrajong	C
Cryptocarya hypospodia	Northern laurel	C
Cryptocarya murray	Murray's laurel	C
Cryptocarya triplinervis var. riparia	Brown laurel	C
Cupaniopsis anacardioides	Tuckeroo	C
Cupaniopsis flagelliformis var. flagelliformis		U
Cynanchum carnosum		C
Deplanchea tetraphylla	Wallaby wireless tree	U
Dillenia alata	Red beech	C
Dischidia nummularia	Button orchid	C
Elaeocarpus grandis	Silver quandong	U
Endiandra hypotephra		C
Eucalyptus intermedia	Bloodwood	C
Eucalyptus leptophyleba	Molly box	C
Eucalyptus tereticornis	Forest red gum	U
Eucalyptus tessellaris	Moreton Bay ash	C
Euphorbia hirta	Asthma plant	C
Euroschinus falcata	Ribbonwood	C
Excoecaria agallocha	Milky mangrove	C
Exocarpus latifolius	Native cherry	C
Ficus benjamina	Weeping fig	C
Ficus congesta	Red leaf fig	C
Ficus hispida	Fig	C
Ficus opposita	Sandpaper fig	C
Ficus racemosa	Cluster fig	C
Ficus variegata	Variegated cluster fig	C
Ficus virens	Fig	C
Flemingia parviflora		U
Ganophyllum falcata	Scaly ash	C
Glochidion benthamianum	Buttonwood	C
Glochidion harveyanum	Buttonwood	C
Glochidion philippicum	Buttonwood	C
Glochidion sumatranum	Buttonwood	C
Gmelina dalrympleana	Grey beech	C
Grevillea glauca	Bushman's clothes peg	C
Grewia retusifolia	Dogs balls	C
Guioa acutifolia		C
Gymnanthera nitida		C
Hibbertia scandens	Climbing Guinea flower	C
Hibiscus tiliaceus	Cottonwood	C

<i>Hoya australis</i> s. sp. <i>tenuipes</i>		
<i>Hypserpa laurina</i>		C
<i>Ichnocarpus frutescens</i>		C
<i>Ipomoea</i> ? <i>triloba</i>		U
<i>Jagera pseudorhus</i>	Foam bark	C
<i>Jasminum aemulum</i>		C
<i>Jasminum didymum</i>		C
<i>Litsea breviumbellata</i>		U
<i>Litsea fawcettiana</i>		C
<i>Ludwigia octovalvis</i>	Willow primrose	C
<i>Lophostemon suaveolens</i>	Swamp mahogany	C
<i>Luffa cylindrica</i>	Bath sponge vine	U
<i>Lumnitzera racemosa</i>	Black mangrove	C
<i>Macaranga involucrata</i>		
var. <i>mallotoides</i>		C
<i>Macaranga tanarius</i>	Blush macaranga	C
<i>Malaisia scandens</i>	Crows ash vine	C
<i>Mallotus philippensis</i>	Kamala	C
<i>Mallotus polyadenos</i>	Kamala	U
<i>Melaleuca dealbata</i>	Tea tree	C
<i>Melaleuca leucadendra</i>	Tea tree	C
<i>Melaleuca quinquenervia</i>	Tea tree	C
<i>Melaleuca viridiflora</i>	Tea tree	C
<i>Melastoma affine</i>		C
<i>Melia azedarach</i> var. <i>australasica</i>	White cedar	C
<i>Memecylon hylandii</i>		U
<i>Melicope elleryana</i>	Evodia	C
<i>Mischocarpus lanchnocarpus</i>		C
<i>Mormordica charantia</i>	Balsam pear	C
<i>Myristica insipida</i>	Nutmeg	C
<i>Myrmecodia beccarii</i>	Ant plant	C
<i>Myrtella obtusa</i>	Fenzlia	C
<i>Nauclea orientalis</i>	Leichhardt tree	C
<i>Nymphaea immutabilis</i>	Water lily	U
<i>Oldenlandia corymbosa</i> var. <i>corymbosa</i>		C
<i>Omalanthus novo-guineensis</i>	Bleeding heart	C
<i>Parsonia latifolia</i>		U
<i>Persoonia falcata</i>		C
<i>Phyllanthus</i> sp.		U
<i>Piper caninum</i>	Native pepper	C
<i>Pittosporum ferrugineum</i>		C
<i>Planchonella chartaceae</i>	Dugulla	C
<i>Planchonella xerocarpa</i>	Blush coondoo	C
<i>Planchonia careya</i>	Cocky apple	C
<i>Pleiogynium timorense</i>	Burdekin plum	U
<i>Polyalthia nitidissima</i>	Canary beech	C
<i>Polygonum subsessile</i>	Smart weed	C
<i>Polyscias australiana</i>	Ivory basswood	C
<i>Polyscias elegans</i>	Cellerywood	C
<i>Pongamia pinnata</i>	Pongamia	C
<i>Prema serratifolia</i>		C
<i>Pseuderanthemum variable</i>	Pastel flower	C
<i>Pycnarrhena novoguineensis</i>		U
<i>Randia fitzalanii</i>	Brown gardenia	C
<i>Rapanea</i> sp.		U
<i>Rhamnella vitiensis</i>		C

Pandanus solms-laubachii		C
Panicum sp. No. 825		U
Phragmites karka	Reed grass	C
Poaceae sp. D No. 1		R
Poaceae sp. D No. 3		U
Proiphys amboinensis	Cardwell lily	C
Scleria polycarpa		C
Scleria mackaviensis		C
Smilax australis	Sarsaparilla vine	C
Sporobolus sp.		U
Sporobolus virginicus	Salt water cooch	U
Tacca leontopetaloides		U
Themeda australis	Kangaroo grass	C
Tricoryne platyptera		C
Typha orientalis	Broad leaf cumbungi	U
Rhynchospora corymbosa		C

PRELIMINARY CHECK LIST OF INTRODUCED PLANTS - SECTION 'D'
CAIRNS CENTRAL SWAMP

PTERIDOPHYTES Ferns

Nephrolepis exalta	Boston fern
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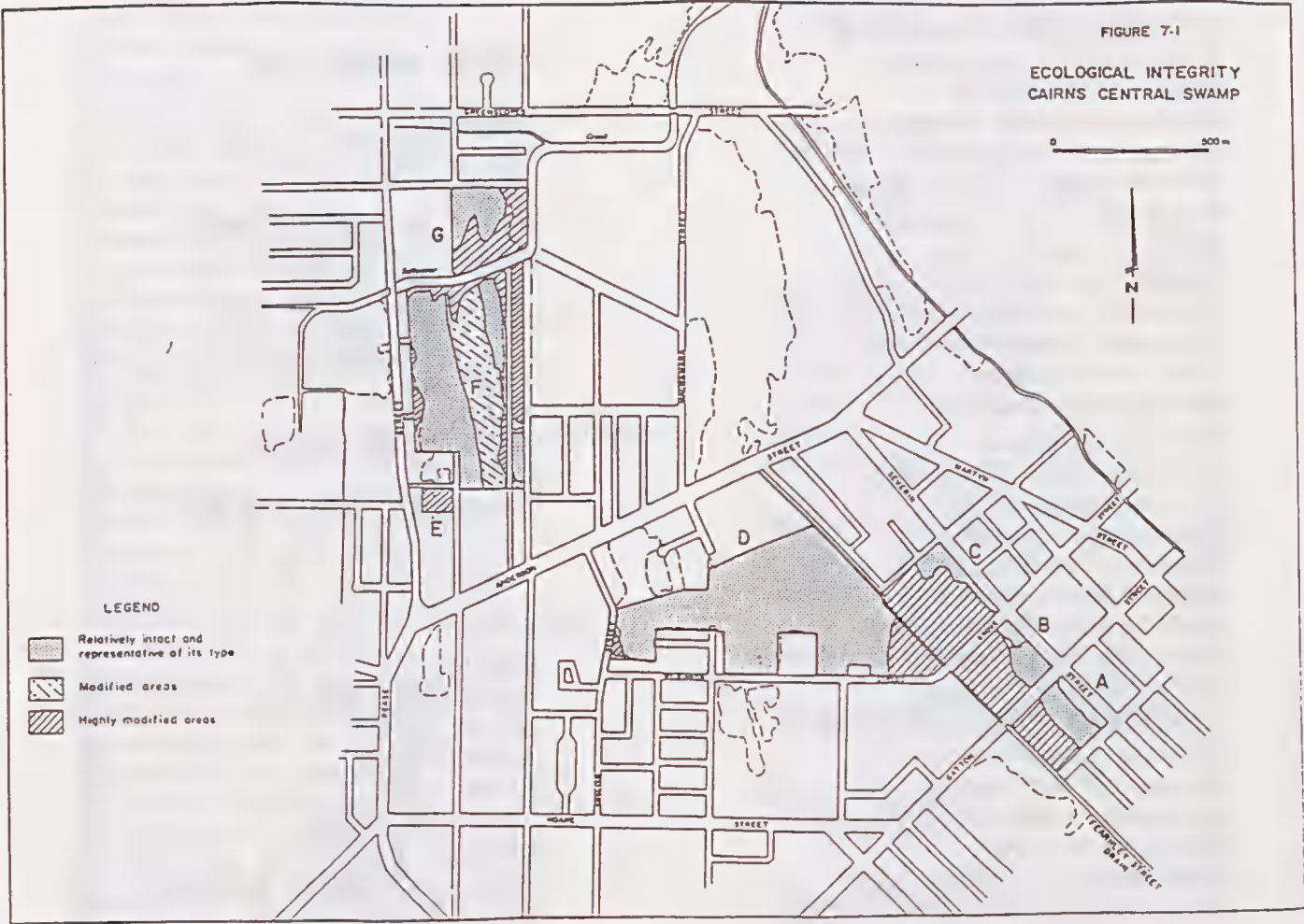
ANGIOSPERMS Dicotyledons

Alternanthera dentata		C
Amaranthus viridis	Green amarathus	U
Ardisia humilis		C
Catharanthus roseus	Periwinkle	U
Centella asiatica	Pennywort	C
Centrosema pubescens	Centro	C
Desmodium tortuosum	Florida beggar weed	U
Eugenia uniflora	Brazilian cherry	U
Gomphrena celosioides	Comprena weed	U
Hyptis suaveolens	Chinese mint	C
Ipomoea hederifolia	Red morning glory	C
Lantana camara	Lantana	C
Mangifera indica	Mango	C
Mimosa pudica	Sensitive plant	U
Mitracarpus hirtus	Clover	C
Mucuna bennettii	Flame of the forest	U
Muntingia galabura		U
Murraya paniculata		C
Passiflora suberosa		C
Perilepta dyerianus		U
Psidium guayana	Guava	C
Quisqualis indica	Rangoon creeper	U
Richardia brasiliensis	White eye	C
Rivina humilia	Coral berry	C
Senna obtusifolia	Sicklepod	U
Solanum seaforthianum	Potatoe vine	C
Solanum torvum	Devils fig	C
Spathodea campanulata	Curse of West Africa	C
Stachytarpheta urticifolia	Blue snake weed	C

<i>Synedrella nordiflora</i>	Cinderella weed	C
<i>Stylosanthes humilis</i>	Stylo	C
<i>Tithonia diversifolia</i>	Japanese sunflower	C
<i>Turbina corymbosa</i>		C
<i>Urena lobata</i>	Pink burr	C
<i>Wedelia trilobata</i>	Singapore daisy	C

MONOCOTYLEDONS

<i>Arecastrum romanzoffianum</i>	Queen palm	U
<i>Brachiaria mutica</i>	Parra grass	C
<i>Cana indica</i>	Canna	U
<i>Chloris ? inflata</i>	Purple top chloris	C
<i>Cyperus aromaticus</i>		C
<i>Dieffenbachia ? leoniae</i>	Dumb cane	U
<i>Dioscorea alata</i>	Yam	U
<i>Eleusine indica</i>	Crows foot grass	U
<i>Epipemnum aureum</i>	Devils ivy	U
<i>Melinis minutiflora</i>	Molasses grass	C
<i>Panicum maxium</i>	Guinea grass	C
<i>Protasparagus sp. No. 1</i>	Asparagus fern	U
<i>Ravenala madagascariensis</i>	Travellers palm	U
<i>Sansevieria trifaciata</i>	Mother-in-law's tongue	C
<i>Syngonuim podophyllum</i>	Arrow head plant	C
<i>Zebrina pendula</i>	Wandering jew	C



RANGE EXTENSIONS FOR TWO BUTTERFLY SPECIES AT COOKTOWN

By: J.A. McLean

Papilio anactus (Macleay) 1826, family Papilionidae, commonly known as the Dingy Swallowtail. The generic status Eleppone is also used by some authors (Dunn and Dunn 1991). This species is found north to about Kuranda and as far south as the Flinders Ranges in South Australia. Small disjunctions are known including one near the tip of Cape York Peninsula, at Bamaga (Dunn and Dunn 1991). (This species has also been sampled from Flagstaff Hill at Port Douglas by the author on the 14th December, 1983). It is most often observed from October to May on Cape York Peninsula (Dunn and Dunn 1991). At Cooktown casual sightings of individuals during December, March and April over the past seven years have occasionally been noted from Grassy Hill (wood/scrubland) immediately to the north of town. While this graceful species may prove to be more wide spread in the area, to date it has been seen mainly from the one locale.

Vanessa kershawi (McCoy) 1868, family Nymphalidae, commonly known as the Australian Painted Lady. Found throughout much of mainland Australia north to about Cairns (Common and Waterhouse 1981). More recent records are also known from Port Douglas (Dunn and Dunn 1991). A colourful species well known further south for great migratory flights, generally in a southerly direction during spring. Dunn and Dunn (1991) give records for this species from Cape York Peninsula on a few occasions during September, October, November and January. Locally this species has been noted over the past seven years from at least six locations close to the town area during August, October, November and December. Sites include the southern base of Mount Saunders (just north of town), the northern base of Mount Cook (just south of town) and an adjacent small grassland ridge, along the old Laura railway line, and from the local racecourse. A single specimen was observed upon a flowering club mangrove shrub Aegialitis annulata at Leprosy Creek on the 11th November, 1993. The most sightings have been from a dirt track at the northern base of Mount Cook on the 18th August, 1992 when four specimens were seen during the morning. Generally however, only individuals are observed occasionally throughout the Cooktown area.

Specimens of Papilio anactus and Vanessa kershawi from Cooktown were sent to Dr. I.F.B. Common for verification and general comment on the 2nd June, 1987 and the 19th August, 1992 respectively. Later they were forwarded to the Australian National Insect Collection in Canberra where they are currently housed.

REFERENCES

- COMMON, I.F.B. and WATERHOUSE, D.F. 1981. Butterflies of Australia. Angus and Robertson, Sydney.
- DUNN, K.L. and DUNN, L.E. 1991. Review of Australian Butterflies: Distribution, Life History and Taxonomy. Privately published, Melbourne.

FIELD NOTES ON A MYOBATRACHID FROG, GENUS PSEUDOPHRYNE
FROM NORTHERN QUEENSLAND

By: William Hosmer

The study area is 3.25km WSW of Ravenshoe on Highway 1, elevation 900m. Tree species in the gully immediately behind the refuse tip study area are listed as Euclayptus phaeotricha, E. intermedia and E. treticornus which occur on these volcanic soils. Included as one of the more common trees here is the Forest Oak, Allocasuarina torulosa, which is indicative of disturbance, probably by fire, as fire-scarred trunks are evident. Other Eucalyptus present, although not in large numbers, include E. crebra, E. peltata, E. citriodora and E. acmenoides. The turpentine, Syncarpia glomulifera, is also present. Large numbers of Acacia flavescens and Hakea plurinerva occur in the understory which also suggests disturbance. Also listed is Lophostemon grandiflorus ssp. riparius. The ground layer is mostly Xanthorrhoea johnsonii. It is interesting to note that there were not a large number of emergent Eucalypts dominating the vegetation. This could be a result of previous clearing and use of the area for gravel quarrying before its present use as a refuse tip. Now of course, the tip must pollute the gully by the leaching of possible toxic waste. Whether or not this desecration has an adverse effect upon frog populations is open to question. In any case, the particular frog species under study appeared to be doing well.

Giant Hamil grass, Panicum maximum grows in the creek bed to a height in excess of 2.5m. This presents an almost impenetrable gallery of thickets. To find the microhabitat of Pseudophryne it is necessary to pull up grass thickets by the root. The frogs were found, together with large eggs in small cavities or short tunnels in and beneath the root systems. Breeding occurs during the 'wet' season between January and February.

The distribution of these cryptic frogs is dependent upon duplication of its habitat.

A modest sample, together with staged tadpoles of this frog are currently being studied at the Queensland Museum, Brisbane.

I am grateful to Eleanor Duignan for the habitat photograph, and to A.J. Morris, Forestry Department, Ravenshoe, who kindly supplied names for the vegetation of the study area.

LITERATURE CITED

COGGER, H.G. Reptiles and Amphibians of Australia, 1983, pp 66-71.

Plate 1. Colour print Pseudophryne sp. in life.
Plate 2. Habitat of Pseudophryne sp. Ravenshoe.



CHOWCHILLAS IN THE RAINFOREST

By: Amy Jensen

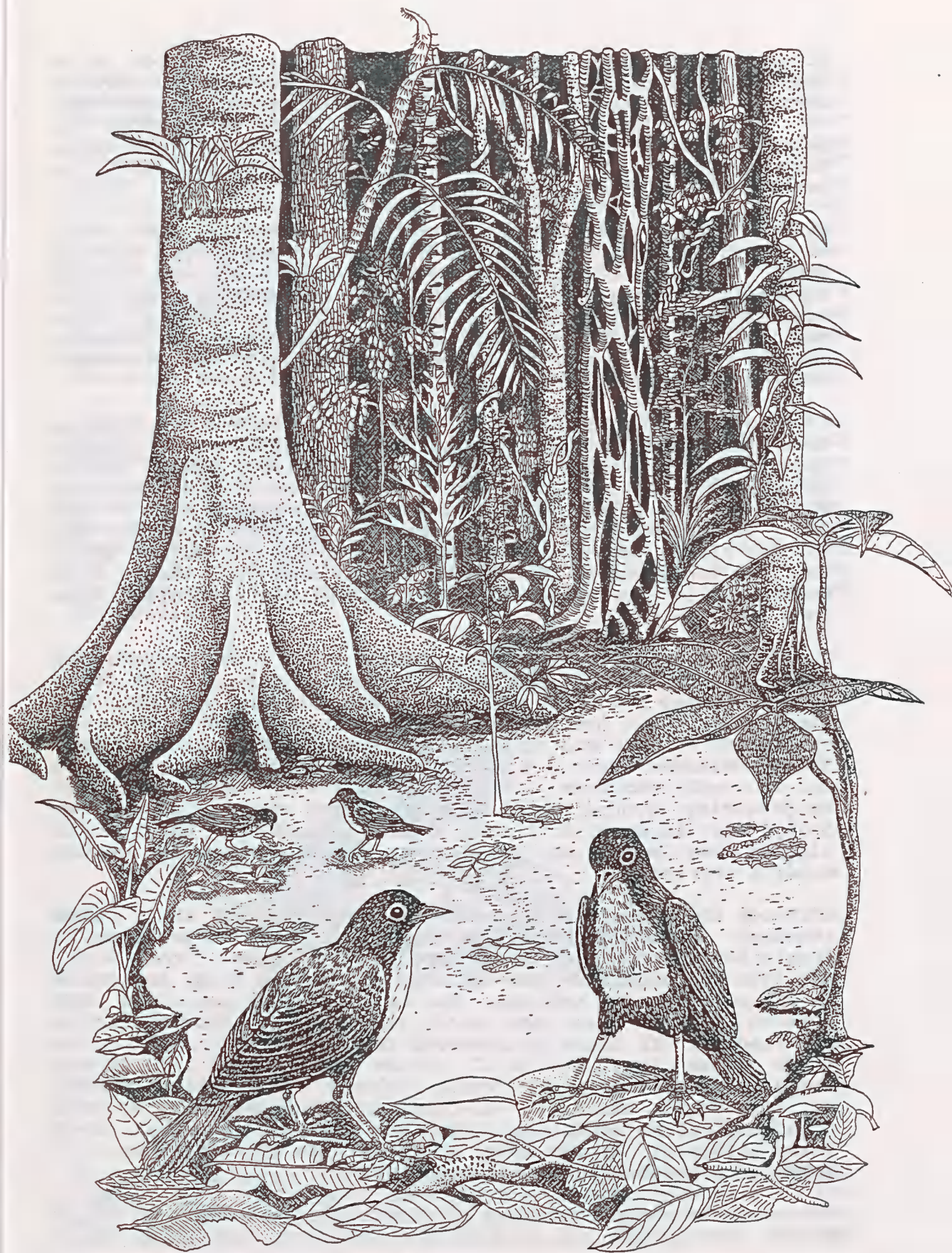
A group of four Chowchillas (*Orthonyx spaldingii*) - small, mostly dark brown birds - scratch in the leaf litter of the forest floor. The light is dim, filtered through the continuous canopy overhead, but the forest floor is relatively open and covered with a layer of leaf litter, rotting twigs and branches. The birds scratch busily, pushing litter to both sides with their strong legs and feet; pecking rapidly at minute animals exposed by their activity. Every so often as one bird turns towards you, you see a glimpse of a female's bright orange breast or a male's white breast and the distinct blue ring around the eye. The birds move slowly over the forest floor, keeping to within a few metres of each other and making quiet 'thrilling' noises and 'chirring' calls every so often.

Later, as you follow the group through the forest, they meet another group of Chowchillas and a loud bout of calling ensues. Some birds stay on the ground while others fly to low perches, then some of them, both males and females, start calling; sometimes all at once and sometimes alternating between members of a group or between groups. The sounds are almost deafening, and incredibly complex - it's hard to believe that one bird can make such a wide range of sound in such a short space of time. Eventually one group chases the other off and then they all return to scratching quietly in the leaf litter.

Several years ago, when I first became familiar with Chowchillas, these observations sparked many questions in my mind which I have since pursued through a PhD research project on the behaviour and ecology of these fascinating birds. I was interested in what they eat, how they search for food in the forest, what kind of space requirements they have, the interactions between members of groups and between neighbouring groups, and how Chowchillas fit into the ecology of tropical rainforests on the Atherton Tablelands of Far North Queensland.

I spent the first few months of my research devising a method to catch Chowchillas to mark them for later identification in the field. Chowchillas are normally hard to catch in mist-nets because they tend to remain on the ground and rarely get tangled if they do get into a net. Therefore, I had to devise a better trapping method.

First, I chose an area where I knew a group frequented. I then set up two or three nets to form a corner or star shape, then played a taped recording of Chowchilla calls which I had recorded earlier at my study site. Generally, the resident birds would respond by running or flying into the nets, and, if I was lucky, I could chase them in and catch them before they managed to escape again.



After the birds were caught, they were banded and fitted with coloured wing-tags so that I could identify each individual by sight. Some of the birds were fitted with radio-transmitters so that I could trace them more easily. The tendency of all members of a group to stay together throughout the day, meant that I only had to put a radio-transmitter on one bird in a group to be able to track down that group at any time.

My study involved spending a lot of time observing the birds and finding where they were at different times of the day and year. I also investigated their food supply - how it varied across the forest floor in different microhabitats and also how it varied seasonally. I was able to relate food availability to the foraging behaviour of the birds, showing how Chowchillas change their foraging strategies at different times of the year.

I found that Chowchillas will eat a wide range of animals from the leaf litter, including many insects, spiders, centipedes, small crustaceans, microhylid frogs, small skinks and snails. Generally food was most abundant at the beginning of the wet season and least abundant at the driest time of the year, in September. Food was patchily distributed across the forest floor, but the Chowchillas were able to adjust their foraging behaviour so that they spent most of their time searching in areas which were more likely to contain more food.

Chowchillas utilize stable home ranges over long periods of time. One group that I started watching in mid 1990 was still using the same range two and a half years later. Within the range that each group of birds uses, they defend a territory by singing at dawn and at various intervals during the day. These defended areas are exclusive - other groups of birds do not encroach into them. Outside these areas, the ranges of neighbouring groups may overlap to some extent. Should two groups meet in one of these areas a bout of territorial singing may ensue if one group encroaches too far on the other's territory.

Although the members of a group will spend most of their time together throughout the year, when it comes to breeding, a single female from each group appears to do most of the work. She lays and incubates the egg then broods and feeds the chick in the nest once it hatches. One or more males may feed the nesting female when she is off the nest and after the chick has fledged. If there is a second female in the group (as there often is), she will either not breed at all, or may breed at a separate nest. Thus, although Chowchillas cannot be considered classical co-operative breeders (as so many other Australian birds are), they are unusual in that they form permanent groups which co-operate in activities such as defence of the territory and foraging.

The other fascinating aspect of Chowchilla behaviour, which I didn't have time to investigate in great detail, is their

songs. Chowchilla's songs are one of the most distinctive sounds of the tropical rainforests of North Queensland. However, those who are familiar with the sounds will have noticed that there is a lot of variability in the songs between different areas. I did some preliminary analysis of songs from my study site and from other nearby areas to investigate these differences. I found that within each group the Chowchillas consistently sang the same song and that the nearby neighbours also had very similar songs. However, the groups slightly further away had distinctly different songs, and with increasing distance the differences became more marked. When I recorded songs at far distant areas, such as Big Tableland, Windsor Tableland and Mt Lewis, I found even more marked variation in the songs - so much so at the more distant sites I wondered if I was listening to the same birds.

I have now completed my PhD research and am working on several scientific papers on the results of my study. Even with observations I have made, Chowchilla behaviour and ecology are so complex that I have raised more questions than I have answered. Some questions which remain unanswered include: What role do Chowchillas play in the ecology of the rainforest floor? How are members of a group related and how does this influence co-operation in different activities? How do song dialects relate to the population structure and dynamics of Chowchillas?



The line drawing for Amy's article was completed by ANDREW DENNIS, who, incidently, was the Club's guest speaker for the monthly meeting held 10/5/94, which proved most interesting and informative. The topic for discussion being 'The Decline of Frogs from Global Upper Regions'.

FLYING FOXES IN COOLITE BOXES

By: Ann Johnston

THE FRIENDS OF THE FAR NORTH FLYING FOXES INC.

One day late in October 1991, my family and I came across a truly horrific scene at the Zillie Falls Scenic Tourist Reserve. Inching through the undergrowth, we came across scores of Spectacled Flying Fox (*Pteropus conspicillatus*) which were either dead or writhing helplessly amongst the leaf litter on the forest floor. Immobilised by tick paralysis, some of them were being consumed alive by maggots, unable to fend off the clouds of circling opportunistic blow flies. Many had a baby attached. Some babies were crying frantically in adjacent vines in an attempt to arouse their dead or paralysed mothers. Wimpers came from all directions and the odour of rotting carcasses permeated the air. We collected the baby bats like picking bunches of grapes, and in no time had a cardboard box full. Adults - still alive, were also collected and this noisy scenario headed for home.

The tragedy was repeated again the next day, and the next, till mid December. The deaths commenced again the following September and the atrocity has been repeated each year since. To date, 1700 live animals have been collected from that colony. Hundreds die before they are found and an unknown number literally drop out of the sky during the night.

Shocked by the magnitude of the tick problem at the Zillie Falls colony, Pam Tully bought land nearby and had a building constructed to house volunteers and researchers. Over the past two years, more than 40 volunteers, some travelling from as far as Brisbane, Melbourne and Adelaide have assisted in various ways with the project at the Milla Milla Bat Rescue and Research Centre. The volunteers include two veterinarian researchers, one vet student and two scientists. The rescue effort has been aided by the hundreds of people in North Queensland who have fostered one or more of the 650 orphan young, which after several months of care, have been released back into Spectacled Flying Fox colonies.

Although the tick causing paralysis, (*Ixodes holocyclus*) is a naturally occurring tick, the enormous number of cases at the Zillie Falls colony is anything but natural. Other colonies appear to experience less than about 50 reported cases a year, nothing like the 1000 known casualties at Milla Milla. A loss of over 1000 individuals from a colony numbering less than 8000 does not reflect a healthy situation for the colony.

Most native Australian mammals which are exposed to the Australian paralysis tick during their daily activities exhibit some degree of inherited or acquired immunity which allows them to function relatively unimpaired by the tick toxin. Close study of the hundreds of tick poisoned flying fox and their attached ticks revealed 85% to carry only one tick. In addition, 80% of the ticks causing death were 5mm or less in length, barely inflated. A fully engorged paralysis tick is

usually 13mm in length. It would appear that the Spectacled Flying Fox at Milla Milla has developed very little natural immunity to the paralysis tick. Previous research has shown paralysis ticks to proliferate in cleared rainforest and along edges of rainforest. Clearing of rainforest has allowed the emergence of low fruit bearing shrubs which are attracting flying foxes closer to the ground. It would appear that rainforest destruction is exposing Spectacled Flying Foxes to a parasite, for which thousands of years of evolution have not prepared them.

The immediate problem facing volunteers each September is how to treat the hundreds of flying fox that rain down from the forest canopy. A vet researcher from Brisbane had carried out many drug trials and autopsies to determine the best procedure for treating flying fox for tick paralysis. The overall survival rate at present is 44%. However, individual trials have produced rates of up to 75%. The main factors influencing outcome are early retrieval, cooling, administration of canine tick anti-toxin and an appropriate antibiotic. Best results, so far, have been obtained when the tick is killed with 'Mortein' and left attached to the bat. In addition, cooling is essential and this has been achieved by either emersion of the bat in the creek, placing in front of a fan, or placing the bat in a 'coolite' box with a block of ice. The Milla Milla Bat Rescue and Research Centre is in need of an air-conditioned shed to house the many bats being treated at one time. Trials have also shown that a dose of 2ml of tick anti-toxin is more effective than the standard dose of 1ml. It costs \$4 to treat a bat with the higher dose of tick anti-toxin. An addition, autopsy has revealed the lungs to be the 'shock' organ in flying foxes and a course of antibiotics is required to prevent lung infection.

Besides relieving the agony of many helplessly paralysed Spectacled Flying Fox, the volunteers collect much scientific data on the tick problem and flying foxes in general, such as size, age, fertility, growth rates and diseases. All data is computerised and the talented volunteers have produced two scientific reports covering the 1991 and 1992 tick seasons. The 1991 report may currently be purchased at a cost of \$5, with the 1992 report being available in the near future. One of the volunteers, an honors student from Southern Cross University, has been collecting spat-out and faecal material from beneath the roost trees of the afflicted colony to determine what the bats are eating when they succumb to tick poisoning. It is hoped that research grants will be made available to members of the group so that research into the tick problem will continue and the opportunity taken, to collect the valuable data from the large numbers of animals handled by the group.

Between the months of September and December, the Milla Milla Bat Rescue and Research Centre operates 24hrs a day. Daily activities include:-

- (a) A two hour colony search every morning and evening for tick affected bats and orphaned babies
- (b) Treatment of up to 35 new cases of tick paralysis
- (c) Treatment of other recovering bats
- (d) Bottle feeding of up to 30 orphan baby flying fox three or four times in 24 hours
- (e) Food preparation and travel to obtain fruit for up to 100 recovering bats
- (f) Phonecalls to foster parents, bat deliveries and foster parent training
- (g) Measuring of baby bats and adults, data recording, banding
- (h) Freezing of dead bats for researchers at A.N.U.
- (i) Providing services for up to 10 volunteers.

During February and March when the hand-reared baby bats have attained 4 to 5 months of age, release programmes are commenced at several different locations near established Spectacled Flying Fox camps.

A project of this magnitude needs lots of ongoing community and Government support. You also could help this project by:-

- (1) Joining the Friends of the Far North Flying Foxes Inc. for \$15.
- (2) Making a donation towards the cost of tick anti-toxin.
- (3) Donating fruit between the months of September to November and February to March.
- (4) Fostering a pair of baby bats for a few months.
- (5) Donating old towels, napkins, Nan baby formula, old weelie bins for fly traps.
- (6) Assisting with daily colony searches or baby bat feeding between September and December.
- (7) Pressuring the Queensland Government to put flying foxes on the protected species list.

IT IS A DISGRACE THAT QUEENSLAND'S FLYING LEMURS ARE USED FOR TARGET PRACTICE!

The Milla Milla Bat Rescue and Research Centre requires the help of another veterinarian to handle the large number of cases encountered.

In addition, live-in volunteers with a scientific or medical background are needed to assist with data collection and recording during the months of September and December.

If you would like to help, please contact:-

Ann Johnston 070 976731 M.S. 1166 Milla Milla Qld. 4872

Pam Tully 070 938858 P.O. Box 300 Kuranda Qld. 4872



Pteropus conspicillatus

APOLOGIES: Sincerely go to Daryn Storch for there having been a line missing in transcript from his article specially written for Journal 196 being 'THE NORTHERN BETTONG AN ENDANGERED ENDEMIC OF FAR NORTH QUEENSLAND.

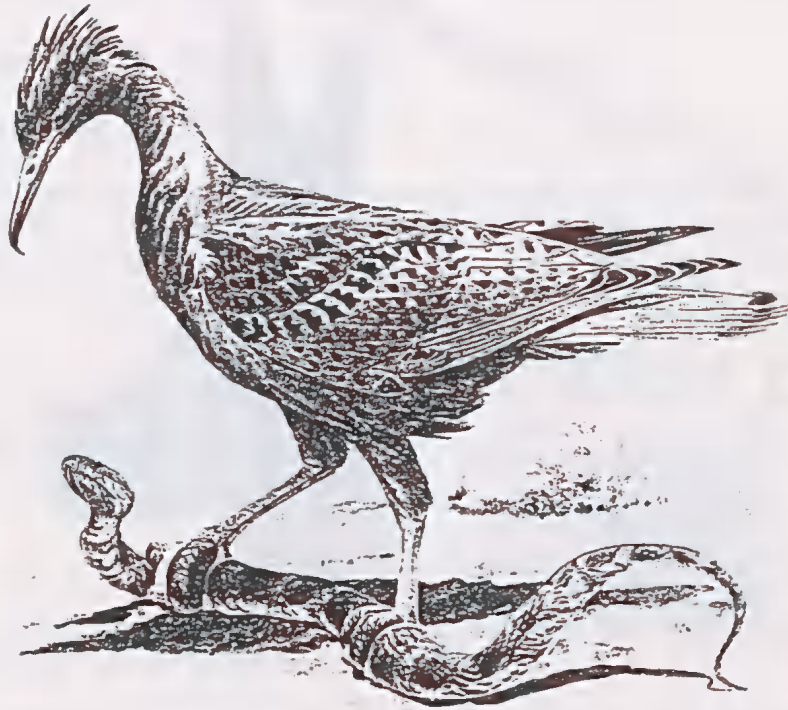
Paragraph 1 should read:

For many years our knowledge of Australia's Northern Bettong (Bettongia tropica) was based on nine skins and skulls, collected earlier this century, and held in overseas museums. The first was collected by Carl Lumholtz in January 1884 at Coommooboolaroo Station in the Dawson Valley west of Rockhampton. All others were from the Wet Tropics region; three obtained by C.M. Hoy 'nine miles south of Ravenshoe' in March 1922, two by H.C. Raven from Vine Creek, Ravenshoe, in May 1922, and three for P.J. Darlington from Mt. Spurgeon in July 1932.

SISYPHEAN SNAKE STRANGLER*Serpentia constrictus*

This rare denizen of the wet tropical rainforests of Far North Queensland feeds almost exclusively on snakes. Classified as a constrictor, this bird squeezes the daylights out of the snakes - causing suffocation. Often two or more birds combine efforts to kill extra long snakes. This co-operation, rare among birds, is called 'team suffocation'.

OBSERVATION HINT: This bird can be decoyed by placing a rubber snake in an open area of the rainforest where the canopy is broken. When the Snake Strangler finds the snake (which it cannot kill), it will often squeeze for weeks before giving up. During this period, observation is easy.



TEAM SUFFOCATION

OBSERVING THE RED-LEGGED PADEMELON (*Thylogale stigmatica*)

By: Christine Gray

Referring to the 'Australian Museum Complete Book of Australian Mammals', the preferred habitat of the Red-legged Pademelon is rainforest.

We live on a small block on the Atherton Tableland in an area where rainforest is broken by cattle pasture, our particular tract (some 14 acres) is half rainforest and half orchard.

When my husband Don and I settled here the pademelons were seldom seen. It was near impossible to observe these gentle creatures in the rainforest as at any slight movement or noise they would dart off through the dense vegetation.

Don and I encourage and protect the wildlife around our home. Dogs, cats and pigs are shot on site. Too many times we had found dead and badly mauled pademelons on our land. Since we have put our methods into practice, there has been an obvious increase in wildlife, including the numbers of pademelons - no doubt feeling safer due to the lack of introduced predators.

Several families of pademelons now venture onto the short grassy areas between the fruit trees and the rainforest in the early morning, late afternoon and overcast days, which gives me ample opportunity for observations.

The pademelon loves to nibble on grass, leaves of the citrus and other orchard trees and shrubs. On one occasion I observed a male pademelon stretch up on his hind legs - reach up with tiny outstretched hand-like paws, tug and pull a gardenia branch down then feed with relish on the leaves whilst holding on firmly. A young female sat approximately 10m away rubbing her ears with tiny paws then bringing the paws over her face in a typical cleaning motion perhaps?

Pademelons also find the fallen fruit a scrumptious addition to their diet, some of these being carambolas, pommello, mango and bananas. However, I believe their favourite to be the spondias or hog plum, which has a spiky seed but they bite and chew at the fruit until the seed is stripped quite clean of flesh whilst holding each piece in a human-like manner.

On another occasion I watched a group of four pademelons resting during the day in the shade of a mandarin tree. A female was sitting on the base of her tail her hind legs extended whilst grooming her young. The other two (each approximately 1m away) resting on its side and stomach respectively. They sensed rather than saw my presence and scurried off to the cover of the rainforest.

At night we often hear their harsh rasping calls as they rush around the house jumping and thumping. It was this thumping and jumping sound which intrigued me early one drizzly morning (7.30am 12/1/92). From the bathroom window I observed a fully

mature pademelon. I could not see if it was male or female, but the notations I made are as follows.

'Pademelon squatting on ground near Ross Sapote (an exotic fruit tree). It jumps approximately 6cm (3 ins) high and thumps ground with hind feet, then bends forward to sniff ground. Continuing with these movements pademelon jumps around in an area of approximately 1/2 metre in diameter, continually thumping with hind feet, bending forward to sniff. After approximately ten minutes pademelon carefully moves out of the section it was thumping, again bends forward sniffing, this time putting out its tongue to lick up an earthworm which it sucks into its mouth (just as one would eating spaghetti)'.

We had heard the thumping many times before. Now we knew what the pademelons were doing. After discussing my observation with a friend (who has worked in a museum) I was advised that in an area of United States steel stakes are driven into the earth then hit with force, the vibrations causing earthworms to surface! He said the pademelons were using vibrations to coax the earthworms to rise. I wondered then if they only do this in our area or has it been observed before elsewhere.

I find the pademelons most interesting creatures to observe and trust that in so doing I may reveal a lot more information.



TRIP TO WESTERN AUSTRALIA (12TH DEC 1993 - 14TH JAN 1994)

By: Max O'Sullivan

The trip to Western Australia was twofold... one, to visit friends and the other to see the endemic birds of the South-West. I had done a great deal of pre-planning and felt I knew ~~THE~~ spots for all the birds I had hoped to see. One of the advantages I had over most who visit that part of the country was time and being a school teacher on holiday I certainly had that.

In this article I will concentrate on the best areas in the South-West and places that can be visited quite comfortably in a week to a fortnight. Some species are quite elusive and you may have to visit a number of possible sights in order to find them. Time of year is also a consideration, even though most species are fairly sedentary they do sometimes disappear from some sites at different times.

Travel and accommodation are easy and is possible to find good Rent-a-car companies with reasonable rates both in Perth and Fremantle. An air-conditioned car would be the best bet in the December/March hot months. All towns in the South-West have all levels of accommodation with Caravan Parks being quite adequate for brief stays.

My trip was a circular one involving a major diversion to the Eyre Bird Observatory at Cocklebidy near the South Australian border. The purpose was to visit this remote area that I had read about and had always wanted to go. It was well worth the long drive from Perth to get there. The sight of flocks of 30 to 40 Major Mitchells at close range was worth the trip alone, apart from all the other things it had to offer.

The basics in any trip should include Bunbury to see the Dolphins at close quarters in the harbour. From there, Brusselton and Cape Naturaliste (Sugarloaf Rock) should be the next stop. In the summer Red-tailed Tropicbirds nest on the rock and are easy to see flying around the island at various times. I saw 5 but I have read of many other unsuccessful visits to the rock at other times of the year. I feel I was very lucky to see this lovely bird. In the coastal heathland nearby there are many possibilities to see various honey-eaters, wrens, heathwrens, Rock Parrots, Red-capped Parrots, White-tailed Black Cockatoos (both species are possible), '28' Parrots, Purple-crowned Lorikeets, and Red-eared Firetail Finch (not seen by me at this spot).

Augusta is also a very beautiful town and the area around Cape Leeuwin. The lighthouse is very good for birds and at the right time of year for whales. Quarry Beach is a lovely spot to visit while you are at the Cape. It is well signposted and is good for sea birds, waders, wrens, Rock Parrots and cockatoos. Once again early morning is the best time to be there. Manjimup is an excellent central spot to explore the area. Nearby Pemberton is more popular with the locals, but

is very over-rated. I would not recommend the local tram trip through the forest, it was not at all what it was supposed to be... more an environmental nightmare! Places to visit in the area include One Tree Bridge and the Four Aces just out of Manjimup. The forest there has many short walks and all are good for birding...especially White-breasted Robin, Rufous Fieldwren (Calamanthus), Western Rosella, Elegant Parrot, cockatoos and Red-winged Wrens. I saw my one and only flock of Red-eared Firetails at Greenfields Farm on my way to the Four Aces. The Tourist Information Office in Manjimup has details of this farm. It is a farm-stay place and has several birds on the property. Between Manjimup and Pemberton is a small National Park called Beedleup N.P. and is another excellent birding spot. There is a resort on the lake called Karri Resort and it looked quite the place for a few days of total self-indulgence! The rates there are quite reasonable in non-holiday times...the stand-by rates being the ones to go for if they are on offer.

The next sight would be Denmark, which I felt was the most beautiful town in all of the South-West. About 20kms to the west of the town is a turn-off to Williams Bay which is well worth the 16 or so extra kms to see Green Pools and Elephant Rocks. Of course on the way to Denmark not far from Pemberton is the Valley of the Giants and that too is well worth a visit. The forests are quite spectacular all through this area. There is also an excellent walk round the inlet which proved a great place for some serious birding. Honey-eaters and wrens are everywhere in the thick bush beside the track.

Next spot to visit is Albany and the wonderfully beautiful but frustrating Two Peoples Bay to search for the three rarest WA endemics, the Noisy Scrub-bird, the Western Whip-bird, and the Western Bristlebird. All are present in what seems to be very concentrated numbers. You can hear the three calling constantly at Little Beach and other areas of the park but seeing them is quite another thing! After catching a good glimpse of the Bristlebird and trekking up sandhills in the heat to 'THE' spot for the Scrub-bird, I finally gave up the chase after only a day and a half. I simply didn't have the patience to keep trying. Hearing them calling all round you was just too frustrating - so I decided I just couldn't cope and left. I'm not sure, even now, if I regret that decision. One thing though, it certainly gives me an excuse for going back there sometime in the not too distant future.

The next place to visit from Albany would depend on any time constraints you might have. I didn't go to the Fitzgerald River National Park and certainly wish I had. Also, I'm told that Bremmer Bay is well worth visiting. It, like Bunbury, has a resident group of Dolphins in the bay which are very tame and also Hooded Plovers on the beach on the edge of the village. The other decision is whether or not you wish to go as far as Esperance. I did, but not from this direction. I went there on my way back to Perth from Cocklebidy and felt it was well worth the visit in spite of the heat wave at the

time. The boat trip around the Bay of Islands was wonderful for Sea Lions, Fur seals, Cape Barren Geese and Black-faced Cormorants as well as many other sea birds, like Pacific Gulls and White-breasted Sea Eagle (that is fed from the boat). At certain times of the year, mainly in the colder months, it is possible to see Penguins and whales.

The other alternative from Albany, and is a 'must' whichever way is decided, is to head north to Porongarup National Park and Stirling Ranges National Park. Both are most spectacular driving towards them as the rest of the countryside is flat (it is a big wheat growing area). I felt if a choice had to be made about which one to spend time at, then I would say quite definitely that it should be Stirling Ranges, as the variety of habitat there is remarkable. The road from Albany goes straight through the park from south to north and it is a the northern boundary where the best birding sites are. There is a caravan park at the entrance to the park which has cabins as well as the usual camping facilities. The Ranger's house is just inside the park and both he and his wife were very helpful in pointing you in the right direction. Regent Parrot, Purple-crowned Lorikeet, Tawny-crowned Honeyeater, Brown-headed Honeyeater, Purple-gaped Honeyeater, White-naped Honeyeater, Western Yellow Robin, Rufous Tree-creeper, Varied Sitella, Grey Currawong, Square-tailed Kite, Splendid Wren, Red-winged Wren and (apparently) Blue-breasted Wren, Elegant Parrot, Red-capped Parrot and Black Cockatoos are just some of the many species that are to be seen within walking distance of the Ranger's house.

Heading back towards Perth I would suggest a visit to Narrogin which is the closest town to the Dyandra State Forest. The birding, both around the town, especially opposite the caravan park just up from the Hospital, and on the way to Dyandra in the early morning is excellent. The road into the forest is also very good and I was fortunate to see a Numbat at close range just before the Caretaker's house. The other good birding spot is around the small dam. Birds seen there in the environs of Narrogin included, Elegant Parrot, Rufous Tree-creeper, Hooded Robin, Western Warbler, White-fronted Chat, Western Thornbill, Western Rosella, Baudin's Black Cockatoo, Yellow-plumed Honeyeater and White-cheeked Honeyeater.

In Perth itself, the best spots would be Lake Monger just north of the city centre where lots of waterbirds, including Blue-billed duck, Australian Shelduck, Freckled-duck, Musk-duck and many others are easy to see. There is a colony of Little Corellas living in the trees around the lake, but they are the nominate race and not the south-western form of it. You have to go further north to find that race. For waders I don't think you could beat Alfred Point, Attadale near Fremantle. When the tides are low there are thousands of waders to be seen as well as terns.

The other area I was recommended to visit was Wugong Brook

just before entering Byford near the outer suburb of Armadale. There is a road leading into a Reserve on the north side of the highway and it can be followed for a long distance criss-crossing the brook. Parrots and Fire-tail Finch as well as two wrens inhabit this wooded creek and adjacent hillsides. I didn't have a great deal of luck here, but I didn't stay too long as it was fairly hot at the time.

Finally, the other major birding 'must' is Rottnest Island which is well worth an overnight visit to see the specialties there...like, Peafowl (eventhough it is hard to tell just when a bird like that becomes 'wild'!) The Pheasants on the other hand are definitely on the wild side and can give you quite a fright (whilst walking up a hillside in persuit of a Quokka) as they erupt from the bushes beside you!

The late afternoon is the best time to see the male pheasants as they emerge from their hiding places to feed close to the settlement. (The area near the lighthouse is best). The various lakes are excellent for all waterbirds including Shellduck, Red-capped Plover, Curlew Sandpiper, Ruddy Turnstone, Banded Stilt (by the 100's), Avocet, Pied Oystercatcher, Crested Tern, Caspian Tern, Bridled Tern, and Fairy Tern to name a few. In the woodlands is possible to see White-browed Scrubwren, Red-capped Robin, Western Warbler, Red Wattlebird and Singing Honeyeater, all of which have survived intact on Rottnest for centuries without interbreeding with the mainland species. Of them all, the Singing Honeyeater has the most developed variation in that it is larger than its mainland cousin and its chest markings are far more striped. There is a Rottnest Golden Whistler which has survived as well, but its numbers are dwindling because of habitat loss.

The most common 'new' birds for me were the Red Wattlebird, and Little Friarbird (Western form) which are very easy to see in Kings Park (another excellent birding spot). In the suburbs, the Laughing Turtle Dove and Singing Honeyeater are as common as muck!

I have very detailed maps and explicit directions to all these birding sites and would be more than willing to share them with anyone who is interested. I decided against a trip north and north-west because of the time of year, but will go back to do that area at some cooler time.

Whilst my main interest (as you can tell) is in birds, I must say I was bowled over by the flora of the whole area. Even in the middle of summer there are species of wild flower in bloom everywhere. The spring must be just so spectacular, I have made it another 'must' for another time.

In all I saw 30 new species and 10 western forms of familiar eastern species, and although I dipped out on the three rarities of Two Peoples Bay I came home quite content with the whole trip.

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